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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,578	08/06/2001	Xinhui Niu	509982001400	2702

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EXAMINER

TSAI, CAROL S W

ART UNIT PAPER NUMBER

2857

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/923,578	Applicant(s) NIU ET AL.	
	Examiner Carol S Tsai	Art Unit 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-10,14-17,22-25,28-31,34-43,48-51,58-65 and 70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3,5-10,14-17,28-31,34-43,48-51 and 70 is/are allowed.
- 6) ☒ Claim(s) 22-25 and 58-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 22-25 and 58-65 are rejected under 35 U.S.C. 102(c) as being anticipated by U. S. Publication 2002/0113966 to Shchegrov et al.

With respect to claims 22, 58, and 59, Shchegrov et al. also disclose a method of determining a profile, comprising: receiving a set of measurements associated with an actual signal (see Fig. 5A, and paragraphs 0008, 0042-0045, and 0047); searching a profile library for a closest matching set of trial parameter values, wherein the set of trial parameter values is associated with a trial signal; determining whether the trial signal satisfies a goodness of fit threshold (see paragraph 0051); and if the trial does not satisfy the threshold, generating a new trial signal using the set of trial parameter values (see paragraph 0051) and storing the new trial signal in the profile library (see Fig. 6B and paragraphs 0011, 0046; 0051, 0060, and 0061).

Shchegrov et al. do not disclose expressly displaying the closest matching set of trial parameter values if the trial signal satisfies the threshold.

It is, however, considered inherent that Shchegrov et al. add displaying the closest matching set of trial parameter values if the trial signal satisfies the threshold (see Figs 4a-4f and computer 40 shown on Fig. 9), because such function provided by the computer is known to be necessary in order that further analysis can be generated by the user via the display.

As to claims 23, 60, and 61, Shchegrov et al. do not disclose expressly communicating an error message if the trial signal does not satisfy the threshold.

It is, however, considered inherent that Shchegrov et al. add communicating an error message if the trial signal does not satisfy the threshold (computer 40 shown on Fig. 9), because such function provided by the computer is known to be necessary in order that error message can be displayed in the screen to warn the user that the trial signal is outside the specified ranges.

As to claims 24, 25, and 62-65, Shchegrov et al. also disclose if the trial signal does not satisfy the threshold, changing at least one parameter range associated with at least one of the trial parameter values (see paragraph 0051).

#### ***Allowable Subject Matter***

4. Claims 1-3, 5-10, 14-17, 28-31, 34-43, 48-51, and 70 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter:

U. S. Publication 2002/0113966 to Shchegrov et al. in view of U. S. Patent No. 6,219,142 to Kane are references closest to the claimed invention. Shchegrov et al. in combination with Kane disclose a method of determining a first actual profile associated with a first grating comprising: receiving a set of measurements associated with a signal indicative of diffraction

from the grating; generating actual spectrum signal data associated with the grating; selecting a first trial profile; generating a first trial spectrum signal data associated with the first trial profile; and comparing the first trial spectrum signal data to the first actual spectrum signal data;. However, Shchegrov et al. in combination with Kane do not disclose determining parameter values for a second trial profile using at least one optimization technique based on the comparison of the first trial spectrum signal data to the first actual spectrum signal data, wherein the second trial profile is associated with a second sample trial spectrum signal data, and wherein the second trial profile matches the first actual profile more closely than the first trial profile and storing the second trial profile and the second sample trial spectrum signal data in a dynamic library of profiles; and including all of the other limitations in the respective independent claims.

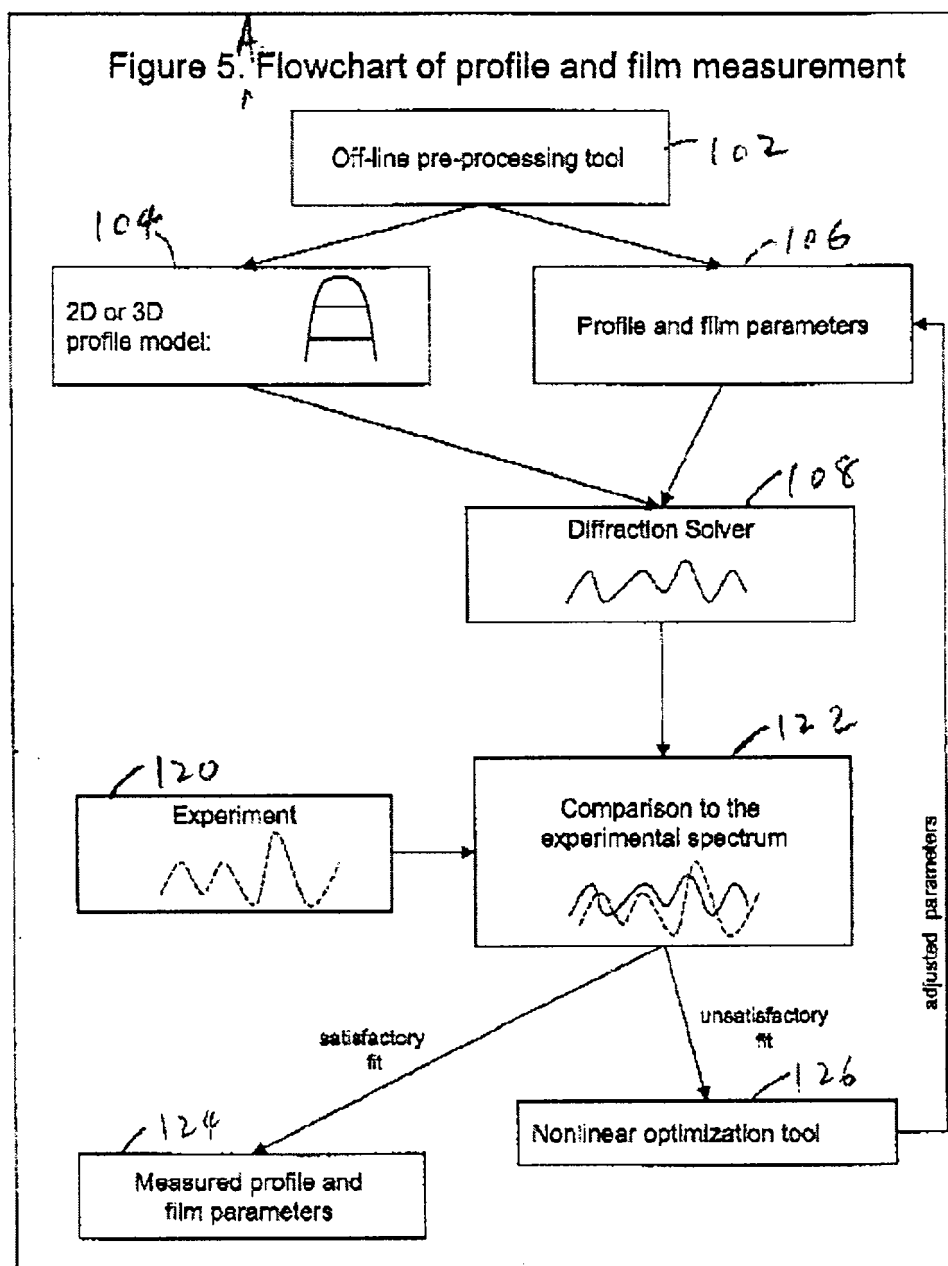
### ***Response to Arguments***

6. Applicant's arguments filed 11/24/2003 have been fully considered but they are not persuasive.

Applicants argue that in paragraph 0051, Shchegrov reference disclose "if the match is less than satisfactory (block 126), the profile and film parameters (block 106) are then varied or adjusted by means of a nonlinear optimization tool (block 116) in a feed back path". In paragraph 59, the Shchegrov reference discloses, "if spectrum or spectra are then compared with the measured data as in block 122 of FIG. 5A and a non-linear optimization tool may be utilized as describe to arrive after convergence, along path 234, at a final set 260 of parameter values of the profile type." In paragraph 60, Shchegrov reference discloses, "in order to speed up the process described in reference to FIG. 5A, a coarse library such as indicated in FIG. 6B may be

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pre-computed off-line, so that each profile type in the gallery is stored together with a number of sets of initial parameter values, such as those corresponding to the intersection points (e.g., 252) in grid-like structure in FIG. 6B, and their corresponding spectra". The Examiner disagrees with Applicants. The examiner broadly interprets the claimed language differently from Applicant. As set forth in the art rejection, in paragraph 51 and Fig. 5A shown below, Shchegrov discloses "**If there is a good match between the two spectra**, the initial values of the parameters of the profile type and of the film(s) then correctly predict those of the actual structure and film(s) that are measured (block 124). **If the match is less than satisfactory (block 126), the profile and film parameters (block 106) are then varied or adjusted by means of a nonlinear optimization tool** (block 126) in a feed back path. The steps of the diffraction solver 108 and the comparison 122 are **repeated until there is a satisfactory match between the predicted spectrum and the experimental spectrum**" that clearly meet Applicants' claimed features of "searching a profile library for a closest matching set of trial parameter values, wherein the set of trial parameter values is associated with a trial signal; determining whether the trial signal satisfies a goodness of fit threshold and if the trial does not satisfy the threshold, generating a new trial signal using the set of trial parameter values and storing the new trial signal in the profile library and storing the new trial signal in the profile library".



### Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol S. Tsai whose telephone number is (703) 305-0851. The examiner can normally be reached on Monday-Friday from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703) 308-1677. The fax number for TC 2800 is (703) 308-7382. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2800 receptionist whose telephone number is (703) 308-1782.

In order to reduce pendency and avoid potential delays, Group 2800 is encouraging FAXing of responses to Office actions directly into the Group at (703) 308-7382. This practice may be used for filing papers not requiring a fee. It may also be used for filing papers which require a fee by applicants who authorize charges to a PTO deposit account. Please identify the



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examiner and art unit at the top of your cover sheet. Papers submitted via FAX into Group 2800 will be promptly forwarded to the examiner.

Carol S. Tsai

12/26/03

A handwritten signature in black ink, appearing to read 'Carol S. Tsai', written in a cursive style.